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# XCAD<sup>DESIGN</sup>

## THE COMPLETE AMIGA GUIDE

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**N**ow that you've got your hands on this month's featured cookbook, you want to know how to use it.

ICAD Designer will enable you to design just about anything you want. From a desk for your Amiga and monitor, to a house extension to put a in. Over the next 50 or so pages we'll be giving you an outline of ICAD Designer's main features. And believe me there are hundreds of them. We'll also be showing you how to design a relatively simple object to put into your house extension: a desk.

The ICAD range of Computer Aided Design packages are thoroughly designed to produce the highest quality results possible on your Amiga. ICAD registered on Unix systems so that should give you an idea of its professional capabilities. But relax, despite its enormous capabilities, ICAD Designer is incredibly easy to use. We show you how...

### **FIRST THINGS FIRST**

The most important thing to do at this stage is to back-up your disk: if you are unsure of how to do this, please consult the Workbench manual which came with your Amiga. See also the disk loading pages inside CU AMIGA. OK, all backed up? Well, read on.

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## INSTALLING XCAD

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Using XCAD Designer from our coverdisk is very easy and straightforward. It will work from either a single floppy disk or can be installed on a hard drive.

### FLOPPY DISK USERS

To use XCAD from floppy disk simply insert the XCAD Design cover disk - follow the instructions for loading and backing up your disk in the menu of 'CD AMIGA' - and run on your Amiga. Once the Workbench display comes up double click on the 'XCAD' icon a window will then appear showing two rooms.

These icons allow you to run XCAD in either medium resolution, recommended if you are using a TV as your monitor, or high resolution, for monochrome monitors that support higher resolutions.

## HARD DRIVE USERS

If you own a hard drive you'll be pleased to know that ITCAD Designer can be installed and run on it. To do this follow these simple steps:

**1.** Create drives on your hard drive with the following names:

XDATA	XSHOPS
XPONTS	XSPPLY
XSLOWLY	DRAWINGS
XMENUS	SYMBOLS

**2.** Now copy the contents of these drives from the floppy disk to the newly created ones on your hard drive. You can do this by typing in the following in the shell, or alternatively use Directory Works from our recent coverdisk which will make this process a lot easier.

### **COPY DFF-XDATA to HDX-XDATA**

You'll need to replace each directory name with each of those above as you proceed.

**3.** Now copy the program files over. In this case they can be dragged using the mouse as normal.

**4.** Finally edit the startup-organize file in the user-startup file (found in the 'B' drive(s) of your local hard drive) to create the following lines:

ASSIGN >NIL: XDATA:	Workbench\media
ASSIGN >NIL: XSHOPS:	Workbench\shops
ASSIGN >NIL: XPONTS:	Workbench\points
ASSIGN >NIL: XSPPLY:	Workbench\supplies
ASSIGN >NIL: XSLOWLY:	Workbench\slowly
ASSIGN >NIL: DRAWINGS:	Workbench\drawings
ASSIGN >NIL: MENUS:	Workbench\menus
ASSIGN >NIL: SYMBOLS:	Workbench\symbols

The startup file can be edited with any normal text editor. You'll need to change 'Workbench' in the above to your particular hard drive name.

And that's it. Now simply reboot your Amiga, load ITCAD from the hard drive and follow the captions on the rest of the book - within a short time you'll be designing buildings that if used Prince Charles used a library of houses.





A finished bathroom, designed to work in XCAD. Try drawing a plan like this yourself. It will improve your understanding of XCAD considerably.

## COMMANDS

### CONSOLE

There are two ways of entering commands into XCAD. The first is to use the mouse to click on commands in the various menus, the second is to use the keyboard to type commands in the 'console' section of the screen. Typing commands is often quicker but until you have gained confidence in using XCAD it is recommended that you use the mouse. Most commands can be abbreviated to one or two letters (in both the manual + entry and XCAD itself the abbreviations are shown in capital letters and the remainder of the command is shown in lower case + **g**: **DRAW LINE**).

PDM options are shown in the manual in bold text, separated by an arrow (e.g. **PDM FILE** **save** **SAVE DRAWING**). PDM and tool bar options are shown in square brackets (e.g. [**LINE**] [**ACTION**]).

### ENTRIES

A line in XCAD is called an entry. Lines can also be grouped together to make a single entry, this makes a sentence of text in XCAD a single entry even though it is made of several letters. Lines, arcs, circles, options, dimensions and arrows are all examples of XCAD entries.

## CLICKING

Clicking at the prompt of placing the crosshair over an icon and pressing the left mouse button briefly. When you click on an entity an 'X' will appear in the console if you have entered a command.

## SYMBOLS

Too vast time when creating a drawing it is often useful to have 'libraries' of symbols ready up. Symbols are XCAD's equivalent of libraries in a paint program. Essentially, a symbol is created by selecting several entities, for example all the lines which make up a complete door, and then saving it as a file. Once created a symbol can be copied onto the screen at any position and angle, saving hours of work.

## BACK SPACE

The back space key on the keyboard is used to cancel the last entry. For this reason a point, a number or anything else

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## GENERAL CAD RULES

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### MOVEMENT

Horizontal movement in XCAD is known as movement in the 'X axis' and vertical movement as in the 'Y axis'. This is standard in all design programs and also in mathematics. Movement to the right is considered to be a 'positive' movement in the 'X axis' while to the left is 'negative'. Similarly upward movement is 'positive' movement in the 'Y axis' and downward is 'negative'.

### ANGLES

All angles in XCAD are measured from the positive X axis i.e. the 'three o'clock' position. Angles more or less than clockwise (taken from the X axis) i.e. thirty five degrees points up and to the right. Again this is meant to be clarified by looking at the diagrams on page 14.





The completed tutorial drawing.

## TUTORIAL - PART ONE

### PART

# 1

Although the tutorial in this manual may seem overly simple it has been carefully designed to introduce NCAD's commands in a simple step-by-step way. Whilst hardly the most exciting of projects, the tutorial should, with a little input of thought, provide all of the main concepts required to use NCAD's full range of tools. It is highly recommended that you follow the tutorial exactly, that way you will be most likely to understand the commands reference section of this manual.

The pictures used in this tutorial were produced using XCAD on a high resolution screen mode (i.e. 640 x 512). If you are using your design on a television or a non multi scan monitor you may find it easier to use a medium resolution instead. All of the commands will work in the same way, though the drawings will appear slightly different. You should still get full benefit from the tutorial whichever screen mode you use.

**Object:** to create a lamp or a table.

If you are designing almost any home interior this is a useful object to save and use regularly. For those who haven't used a CAD package before this may seem complicated but should provide you, if you follow the instructions properly with a good grounding in using XCAD designs. Those who are familiar with CAD will find it easy enough.



The standard opening screen for AutoCAD

The screen should look like this when you select **EDITING** screen?



When you first load AutoCAD you should be presented with a screen which looks like the one at the top of the opposite page. The program is all set up and ready to go. The central white area is the "paper" on which your drawing will appear. The tool bar is on the right hand side and is simply a list of commands. At the bottom of the screen is the "line editor" where commands appear and can also be typed in. The console also has a small status bar at the very bottom which includes details on the drawing and the amount of memory left.

The first thing to do is to create the "paper" for the job at hand. For this example we are going to produce a small floor plan so it needs to be a reasonable size, in this case ten metres by ten metres. So go to

#### **PERS-VIEW and select DEFINE SHEET**

(i.e. hold down the right mouse button, move the mouse over 'VIEW' in the top right of the screen, move the mouse down to the 'DEFINE SHEET' option in the list, release the right mouse button.)

Your screen should now look like the one at the bottom of the opposite page. The box which has appeared in the top left of the screen is a PLM (Pop Up Menu).



This is ACAD's standard numerical PUM.

Now select 'numeric' from the PUM by moving the crosshairs over it and pressing the left mouse button.

**[NUMERIC]**

Now select width:

**[WIDTH]**

You should now see a PUM resembling a calculator. (See the icon at the top of the opposite page.) This is the numerical input PUM, it is used throughout ACAD as a simple way of using the mouse to input numbers.

**[1] [0] [SPACE]**

The controls at the bottom of the screen should now read:

**DEFIN: SHOOT: Custom Width: 18**

If it doesn't then press the back-space key to delete the number and re-enter it. Then repeat the process for height:

**[HEIGHT] [1] [0] [SPACE]**



Following the units of 10 used

The completed operation: 10 pages 10 metres square



Now select

**[UNIT]**

Which brings up a new PUM (see top opposite). Select

**[METRES]**

Which completes the specification of the page. The console should now read

**Define Sheet Width 10 Height 10 Units METRES**

All that remains to do is to confirm it (if you have made a mistake you can use either the back-space key to change what you have done or [QUIT] to quit again). If you're happy with it select

**[RETURN]**

You should now see a screen like the one at the bottom of the opposite page. Congratulations, you have already manufactured the basic menu system used by NCAD



The rectangular grid is used for dimension work.

The first entity drawn, a rectangle rectangle.



To ensure that lines are placed accurately, XCAD uses a "grid" which "snaps" to horizontally the grid in a series of dots on the screen at regular intervals. When you place a point on the screen XCAD automatically puts that point on the nearest dot, this is called "snapping". Initially we will use a grid with dots spaced at 0.25 mm intervals. Select "grid" from the tool bar and select the following:

[GRID] [L] [3] [0] [SPACE] [RETURN]

You should now have a screen covered in dots like the one at the top of the opposite page. Now to create the outline of the boxes, which should be 4.5 m by 0.75 m. Select "rect" from the tool bar:

[RECT]

Move the cursor into the middle of the "paper" and click once. Drag the cursor to produce a rectangle two dots wide and three dots high (like the one at the bottom of the opposite page) and then click again. You can use the back space key to "undo" any mistakes you make. Finally select:

[RETURN]



The look of the table as it should be:



Now let's get a little closer to the action. Select:

**[ZOOM]**

Having selected this, click on a point near your original rectangle and drag the resultant box out to make a 'zoom out' rectangle around the one you have already drawn (like the one at the top of the opposite page). Note that the picture is magnified (see bottom left); we need to make the grid more detailed so click on the following:

**[GRID] [.] [W] [Z] [SPACE] [RETURN]**

Now to draw the head of the beam select:

**[H4,T]**

And click on the same dot as shown in the bottom picture on the opposite page to obtain the same rectangle:

**[RETURN]**

Hardly a masterpiece so far, but it does get better



Click any corner of the top-right circle (used to define your perspective) on screen indicating where the circle should be placed. (Usually it should look like this.)

... this view (top) should be done. Then create a line.



Now to create something a little more complex, the plug hole. Click on the following.

**(CIRCLE) (RADIUS) [.] (0) (2) (5) (SPACE)**  
**(ACTION)**

Now position the centre of the circle by clicking somewhere well outside of the outline of the tank, as shown in the diagram at the top of the opposite page and select

**(RETURN)**

Now create another, slightly larger circle in the same position. Again select the following in order (the usual 'n' is not a command in this instance, it signifies a point or object selected by clicking on the left mouse button at the desired area. In this case you must click with the mouse at the location prescribed in the top caption on the opposite page)

**(CIRCLE) (RADIUS) [.] (1) (8) (2) (5) (SPACE)**  
**(ACTION) n (RETURN)**

You should now have a drawing which looks like the one at the bottom of the opposite page. Let's now go and get a closer look at the plug hole.

**(ZOOM) xx** (these two clicks should be used to create a zoom first as described on page 27)



Here is where the line should go

Now copy the line so there is a line to work with



Now for something a little tricky, you are going to use one of DCCAD's newest features. First though you'll need a line to work with, by entering:

[LINE] [ACTION] **xx**

To produce a line like the one in the picture at the top of the opposite page by clicking (x) once to select the center point of the circle and then clicking (x) again on the circumference of the outer circle. Then select:

[RETURN]

Now for the fun bit, to even trying to draw another 11 lines around the circle and then to:

[EO-COPY] [ANGLE] [0] [R] [SPACE] [NTIMESS]  
[1] [1] [SPACE] [ACTION]

Then click on the line you have just created, as in the diagram at the bottom of the opposite page, then click on:

[NEXT]





Using move, clicking on all of the lines in the plug



And finally, the "Ro-Copy" function needs to know which point to rotate the line around so click at the center of the circle

#### 2. [RETURN]

and key press, you should now have a diagram like the one at the top of the opposite page. Now to get the plug hole into the work. first though you'll need to be able to see the work, select

#### [ZOOM-ALL]

this means as in the manner described previously so that you can see both to-draw on

#### [ZOOM] or

and finally the move itself

#### [MOVE]

You now need to select all of the lines which make up the plug hole, you should do this by clicking on all of the lines until they are highlighted like the picture at the bottom of the opposite page or select

#### XXXXXXXXXXXX [NEXT]



... and create it into the base.

Lastly the 'Move' function needs to know the start and end points of the move. Click on the center of the plug hole, then click on a point 1/2 inch down and three inches from the right-hand side of the bowl as in the picture opposite. You now have the beginnings of a really good base. A few more modifications and some taps are needed but we'll do that in the next instance. If you have plenty of time you could head straight on to it. Perhaps it would be wiser to save all of your work first though, so in the PCIM menu select File and then save drawing. or

#### PCIM: FILE . . . SAVE DRAWING

Then type a file name at the keyboard, it is probably sensible to call it 'base' or something equally obvious like 'base.dwg' so that it is easy to remember, for example

"base" (RETURN)

---

## TUTORIAL - PART TWO

---

PART

2

Now that you have a basic outline of a creek it is time to spruce it up a little. The most important addition being some logs. If you have taken a break between this and the first tutorial then you will need to re-load your drawing and zoom in. By now you should be perfectly able to do this without prompting. If not, check back over tutorial one. The Zoom feature is essential. Remember, you have created an area that takes up ten square metres.

For this tutorial it is assumed that you have both completed and understood the previous sections. Some major new concepts are introduced but if you have managed so far then you should find them easy enough.



The top line is selected first so we go anti-clockwise around the corner.



The opposite line is now selected.



The opposite line is selected first and going anti-clockwise.

The most obvious feature of the work so far has to be that it is very angular. To rectify this we will "fillet" the lines. Filleting rounds sharp corners.

**IMPORTANT** Fillet only works properly in an anti-clockwise direction, so make sure you click on lines in the correct order. First click on

[FDM: DRAW] → [DRAW SPACE FILLET] [1] [R]  
[5] [SPACE] [ACTION] x

Where 'x' is the top line (as in the diagram at the top of the opposite page) then select

x [RETURN]

that 'x' is the line furthest to the left. You should now have a picture like the one in the frame of the opposite page. Repeat this process for the other round corner by selecting

[FDM: DRAW] → [DRAW SPACE FILLET] [1] [R]  
[5] [SPACE] [ACTION]

Where the 'x' is the furthestmost line to the right as in the diagram at the bottom of the opposite page (because it is the first line if you go anti-clockwise). Then select —

x [RETURN]

thus completing the curves.



... makes the outline of the bowl bowl (not right)

Now to increase the process a little. This time it is the bowl which needs some curves. We will do the whole thing using just one filter command, select:

**[F10] DRAW → DRAW SPACE FILLET [1] [0]  
[1] [0] [SPACE] [ACTION] OK**

Where the two to use the top line and the right line (note that we are travelling anti-clockwise around the bowl) click on:

OK

... the right line and the bottom line

OK

... the bottom line and the left line ...

OK

the left line and the top line: ...

Finally select [RETURN]

...and it is done. You should now have a nicely curved bowl to your liking



The new circle made using the three-point method.

The window state, ready before printing values.



Now that you have a reasonable-looking house, it is time to add some taps. For these we will introduce the idea of symbols (like brushes in a paint program). First, though, we need to draw the taps, click on

**[CIRCLE] [ACTION] xxx**

With 'xxx' in the same position as shown in the diagram at the top of the opposite page. This is an alternative to the previous way of drawing circles, in that now the three points are all covered by the circle. Now select

**xxx [RETURN]**

With 'xxx' in the same position as the diagram at the bottom of the opposite page. Then click on

**[ZOOM]** **xxx**

to get a closer view of the circles



Drawing several  
times it will get  
the line into  
through.



... All into the line  
for the circle.



... Just like this.

Now to draw in some more details, select

[LINE] [ACTION] now [RETURN]

Where "now" indicates the three lines shown in the diagram at the top of the opposite page

It is immediately noticeable that this looks very rough, so we will trim the lines by selecting

[TRIM] [AGAINST] [ACTION] x

Where "x" is the outer circle as in the diagram center opposite. The reason for selecting the circle first is that you are removing the line AGAINST the circle. Then select

x [NEXT]

With "x" being the piece of line which has gone in the diagram bottom opposite. Then repeat the process for the other corner end by clicking on

xx [RETURN]

The picture is beginning to look like a top of hat. There's just one more thing to do ...



This screenshot  
represents a  
single step.



Using copy/paste  
added the line with  
the origin at the  
center point of the  
circle circle.



... and there you  
have it, a proper  
switching gifi.

... and that's to give the handle a little bit, so select on the same order

[LINE] [ACTION] or [RETURN]

As in the diagram at the top of the opposite page. Now to use "Bo-copy" in a slightly different way from last time.

This time select

[BO-COPY] [ANGLE] [4] [5] [SPACE] [NTIMER]  
[7] [SPACE] [ACTION] or [NEXT]

Where "4" means select the line you have just drawn then

or [RETURN]

and that "4" is the center of the circle. This will XC&D to draw the line 7 more times but using the center of the circle to spin it around. You should now have a completed tap like the one at the bottom of the opposite page.

Now to turn the tap into a symbol and have a neat sheet-out in the way ... go to FILE Symbol, select Define Symbol and then name like so

PUSH SYMBOL.  DEFINE SYMBOL. [NAME]

then type "tap" at the keyboard...

"tap" [SPACE]





Creating a window using the window option.



Now for the tricky bit – rather than clicking on all the lines which make up the top, go to PDM history, select Window.

### PDM ENTITY → WINDOW

... and make a rectangle around the entire top as in the picture top opposite. Then click on ...

or [NEXT] >

... and the origin should be the centre of the circles.

The window option only selects lines which are completely inside the rectangle drawn.

To show the difference, try selecting the following:

[DELETE] or [NEXT] >

Where 'XXXX' are any lines you choose. Then try again, making with

PDM ENTITY → WINDOW or [NEXT] >

You now need to place the taps on the beam, so select ...

[ZOOM-ALL] or [ZOOM] >

to get the beam back into sight. Now to place a tap on the beam. It needs to be placed at an angle of -90 degrees.



Place the top  
right on the fillet  
corner.



... produces a solid  
cut through wall.



When you finish it,  
this reference feature  
usually results the solid  
to any fillet/round type  
problem. The using  
your capabilities to  
produce a part of  
your technique.

(turned clockwise) so that it is positioned correctly. So go  
to PDM and select Symbol and Draw Symbol or

**PDM: SYMBOL → DRAW SYMBOL**

then select the following

[NAME] "top" [PARAMETERS] [ANGLE] 0-1 [H]  
[R] [SPACE] [ACTION] x [RETURN]

Where "x" is a suitable position for the corner of the top, as  
on the diagram top opposite. Then the other top, which can  
be placed using a different technique.

[MC-COPY] x [NEXT]

Where "x" is the top

or [RETURN]

... and "or" is the axis (line about which the top will be mir-  
rored). Now you have the completed feature. If you still feel a  
little uncertain with KCAD then try reproducing the feature  
without the instructions or even the entire Padroom, which  
should improve your confidence greatly.

---

## ICAD COMMANDS

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Now that you have completed the tutorial, the commands presented here should be easy to follow. These will allow you to use ICAD Designer to produce excellent results. For further instructions and a CD-ROM exclusive upgrade to ICAD 5000-contact Plausport Data Productions, call 800-281-1158. Upgrade price: \$295/yr.

The system used to describe commands in the following sections is the same as that used in the tutorials. If you want to learn the abbreviations for commands entered into the console, the abbreviations are shown in the index.

Once you have gained sufficient experience of using ICAD, you should find it relatively easy to either make an educated guess about a particular command's function or to experiment with its use.

Where possible you should experiment with the commands repeatedly before using them for real, sometimes they don't work in quite the way you thought or change slightly depending on the order of clicking (like liles). If you have even the slightest doubt, save your work first!



AutoCAD is only feature, but your programs may be better for this set of things

## FILE COMMANDS

There are pretty much standard file options, as found in any Amiga application. If you experience trouble here, read your Workbench manual, it contains far more detail on file handling than could be included in this manual.

**CLOSE DRAWING** - Save the current drawing and open a new, blank, sheet

**CLOSE MENUSTRIP** - Removes the current tool buttonstrip from the screen.

**EXIT ACAD** - Quit the program and return to Workbench.

**OPEN DRAWING** - Load a previously saved drawing

**OPEN MENUSTRIP** - Load a new tool buttonstrip

**SAVE DRAWING** - Simply save the current drawing without closing it. Usual, you should use this option regularly whilst working

In all the following examples remember that a small 'a' is one click of a left mouse button which selects a point where your cursor was situated



A simple 90-degree arc

The line is tangential to the circle



## DRAWING COMMANDS

All of these commands are accessed from the **DRAW** menu.

**DRAW ARC** - Part of a circle.

**STARTANG** - Angle at which the arc starts (parameter it's anti-clockwise from the 3 o'clock position)

**ENDANG** - The angle at which the arc ends

**RADIUS** - Radius of the arc

**PARALLEL** - Distance in current units (e.g. 10.0 mm) used to calculate radius of the arc in relation to another arc or a circle

Example:

**DRAW ARC**

```
[STARTANG] 90 [ENDANG] 180 [ACTION] =
[RETURN]
```

## DRAW LINE

**LENGTH** - Length of line in current units

**ANGLE** - Angle of line in degrees

**PARALLEL** - Distance in current units from another entity

**TANGENTIAL** - Used to draw a line at a tangent to arc or more circles.

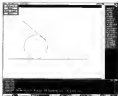
**PERPENDICULAR** - Draw the line at 90 degrees to an entity

**RECTANGLE** - Draw a box

Example: **DRAW LINE**

```
[TANGENTIAL] [ACTION] = [NEXT] = [RETURN]
```

The first click is to select the object to be tangential to



An ellipse rotated at 45 degrees.



## **DRAW CIRCLE**

**RADIUS/DIAMETER** - In current units.

**TANGENTIAL** - As a tangent to another entity.

**PARALLEL** - Distance in current units from another circle or arc.

Example:

## **DRAW CIRCLE**

[RADIUS] 50 [TANGENTIAL] [ACTION] or  
[RETURN]

Circles may also be placed by specifying points (see notes at page 43).

**DRAW ELLIPSE** - Arc-swept shape.

**MAJORDIAM** - Diameter of the larger part of the ellipse.

**MINORDIAM** - Diameter of the smaller part.

**STARTANG** - Starting angle in degrees.

**ENDANG** - Ending angle in degrees.

**ROTATE** - The angle at which the ellipse is placed.

Example:

## **DRAW ELLIPSE**

[MAJORDIAM] 40 [MINORDIAM] 30 [ROTATE]  
45 [ACTION] or

Ellipses can also be placed by specifying points in a similar fashion to **DRAW CIRCLE**.



**DRAW SPLINE** - A smooth-curve tool

**CLOSED** - Creates a closed loop

Example:

**DRAW SPLINE**

**[ACTION]** xxxxxx **[RETURN]**

**IMPORTANT:** Splines work in a different way to most entities. Experiment for best results.

**DRAW STRING** - Creates multiple lines as a single entity

**CLOSED** - Creates a closed loop.

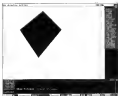
**RECTANGLE** - Creates a rectangle as a single entity (a normal rectangle is four entities).

**PARALLEL** - Distance from another entity in current units.

Example:

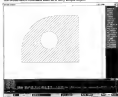
**DRAW STRING**

**[CLOSED]** **[ACTION]** xxxxxx **[RETURN]**



A diamond four sides, 45° open

This window is also a command used as a fairly simple object.



**DRAW POLYGON** - A closed shape which is solid. This is a slightly more complex tool than most. It can be used to create a simple filled shape or, by using **CHAINLOC** in the **LOCATION FROM** can fill complex objects which have up to 30 "holes" in them.

Example 1:

**DRAW POLYGON** [ACTION] xxxx [RETURN]

This will draw a polygon as shown at the top of the opposite page

Example 2:

**DRAW POLYGON** [ACTION] **LOCATION** -  
**CHAINLOC** x [NEXT] **CHAINLOC** x [NEXT]  
**CHAINLOC** x [NEXT] [RETURN]

Where the first 'x' is the object outline, the second and third are the inner 'holes' as illustrated in the diagram middle opposite

**DRAW SHAPE** - Creates cross-hatching, works in the same way as **DRAW POLYGON**.

**DISTANCE** - Gap between lines in current units.

**ANGLE** - Default is 45 degrees

Examples:

**DRAW SHAPE** (DISTANCE) 10 5 [ACTION]  
**CHAINLOC** x [ACTION] **CHAINLOC** x  
[RETURN]





A) Block created by joining three solid rectangles.



A) Block created in the same way as the individual.

**DRAW FILLET** Creates smooth corners

**RADIUS** Radius of the curve on current entity

**NOTRIM** Leaves the edges rather than trimming them  
Example.

**DRAW FILLET (RADIUS) R.5 (ACTION) on**

There are two other commands available in the draw menu, **ARROW** and **CPOINT** which behave in the same way as some of the above functions. It should also be noted that several of the commands listed previously have either only partial explanations of their functions or a very limited description of these capabilities. The full manual contains more in-depth instructions on all of the above but you should be well able to get by with these.



The top of normal size.

Shows a double size symbol for the reader comparison.



## SYMBOLS

As shown in the tutorial, symbols are essentially the same as brushes in a paint program. They can be placed anywhere on the sheet at any angle and any scale. They save an enormous amount of time when creating a complex, repetitive drawing. All of these commands are accessed from the **SYMBOL** menu.

**CHANGE SYMBOL** - Alter a symbol which has already been placed.

**ANGLE** - Rotate the symbol.

**HORIZONTAL** - Turn the symbol upside down (mirror about the X axis).

**VERTICAL** - Turn the symbol left to right (mirror about the Y axis).

**SCALE** - The size of the symbol (1 is normal size).

Example:

**CHANGE SYMBOL (SCALE) 2 (ACTION) x**

Doubles the size of a symbol.

**DEFINE SYMBOL** - Pick up a symbol, refer to tutorial on page 63.

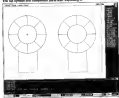
**NAME** - Filename of the symbol.

**DRAW SYMBOL** - Place a copy of a symbol on the sheet.



The top update-replacement dialog.

Use the symbol and component parts after exploding it.



**NAME** The symbol to be used

**ANGLE** Angle at which symbol is placed

**MIRRORX** - Update device (mirrored about the X axis)

**MIRRORY** - Lock to right (mirrored about the Y axis)

**SCALE** Size of symbol (1 is normal size)

Examples:

**DRAW SYMBOL NAME "fan" (PARAMETERS)**  
**(MIRRORX)**

**EXPLODE SYMBOL** Reduces symbol to component parts.

The symbol returns to being the lines which make it up

Useful if you wish to modify an existing symbol. The

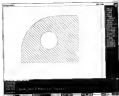
drawing can be turned back into a symbol by using

**DEFINE SYMBOL** again

**UPDATE SYMBOL** Replaces the selected symbol with  
 a newer version

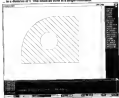
The replacement symbol must have the same filename

Useful if you have modified a symbol



Changing the cross-hatching to 1/2 degree cross-hatch

... as a result of this, this enables them to single commands



## EDITING COMMANDS

All of the following commands are accessed from the **EDIT** menu. They are used to modify an existing entity. This is one of the most useful parts of ACAD.

**CHANGE HATCH** - Modifies an existing cross-hatch.

**DISTANCE** - Separation of lines in current units

**ANGLE** - Angle of lines in degrees

Example

**CHANGE HATCH [ANGLE] [UN] [ACTION] :**

**DELETE ENTITY** - A self explanatory and often used command

See page 47 for a short example of its use

**MIRROR ENTITY** - Produces a mirror image of the selected entities

**COPY** - Produces a copy of the original rather than moving it.

See page 50 for an example of using it with the copy option



Producing 2 overlapping circles

... and a smaller than one. Still goes perfectly



**MOVE ENTITY** - Moves the selected entities from one place to another

**COPY** - Produces a copy of the original rather than moving it.

See page 31 for an example of a move without the copy option.

**ROTATE ENTITY** - Rotates the selected entities.

**COPY** - Produces a copy of the original rather than rotating it.

**ANGLE** - Angle of rotation in degrees

**NTIMES** - Number of times rotation should be performed.

The example on page 45 gives a good idea of what can be achieved

**SCALE ENTITY** - Changes the size of the selected entities.

**COPY** - Produces a copy of the original rather than scaling it.

**SCALE** - The scale factor (1 = full size)

Example

**SCALE ENTITY (COPY) (SCALE) 1.5 (ACTION) x (SPACE) x**



...and choose the other



**TRIM ENTITY** - Clip the end of a line to a specific point.

**AGAINST** - Clip a line against an entity

See page 43 for a good example of using trim against

Once again, there are more commands available if you examine the menus but these will start you out on the right footing



A blank page with an invisible grid selected

A screen from before being restored, note the corrupted extent and grid



## DISPLAY COMMANDS

All of these commands are accessed from the **DISPLAY** menu.

**LIST GRID** - Describes the parameters of the current grid in the console window

**REDRAW DISPLAY** - Refreshes the screen, useful if some objects are corrupted

**SCROLL WINDOW** - Moves the visible area.

**UP** - Scroll up by half a screen

**DOWN** - Scroll down by half a screen.

**LEFT** - Scroll left by half a screen

**RIGHT** - Scroll right by half a screen

This command is extraordinarily useful when working at close range



An isometric grid in perspective with a new isometric grid.

Creating a circle in full screen.



**SELECT GRID** - Create a grid of a certain size

**SIZE** - The grid spacing in current units

**XPTCH** - The horizontal grid spacing in current units

**YPTCH** - The vertical grid spacing in current units

**ISO** - Create an isometric grid

**XAXIS** - The angle in degrees of the X axis

**YAXIS** - The angle in degrees of the Y axis

Example:

**SELECT GRID [XPTCH] 1 [YPTCH] 0.5**

**ZOOM ALL** - Show the entire sheet.

**ZOOM DOWN** - Double the magnification

**ZOOM UP** - Halve the magnification

**ZOOM WINDOW** - Zoom in on a specific area







Measuring the perimeter of a rectangle



and the area

## VERIFY COMMANDS

Verify is used to measure lengths, areas and angles. Its commands are accessed from the VERIFY menu.

**MEASURE DISTANCE** - Show the length between points.

Example.

**MEASURE DISTANCE** xxxx

Where 'xxxx' are points you want to measure.

**MEASURE AREA** - Show the area of the selected entities.

**ENTITY** - Show the area selected with 'xxxx'

**MEASURE AREA [ACTION] CHAINLOC** x



Diagram showing the multiple option.



## TEXT COMMAND

This section should get you started putting text into your drawings. These commands are accessed from the **TEXT** menu.

**DRAW TEXT** - Place text on the sheet

**RECTANGLE** - Place the text in a rectangle.

**TEXT** - Must be entered before typing your text.

**PARAMETERS**

**HEIGHT** - In current units.

**WIDTH** - In current units.

**ANGLE** - Rotate the text to specified degree.

**SLANT** - Indicate the text by specified degree.

**DRAW TEXT (TEXT)** "Along the right side of the wall will be ready soon." [ACTION] [ENTER]

**IMPORTANT:** Text should be entered in two sets of quotes exactly as shown above. The single quote at various intervals will ACAD to place the text on multiple lines, as shown in the diagram top opposite. Clicking more points than there are text lines will make ACAD repeat the text line so as the diagram bottom opposite.



Let's draw some text. Try using more options.

A standard label. Try using more options.



**SELECT TEXT** - Create the default text format.

**ENTITY** - Use selected line & attributes as default text format.

**PARAMETERS** - As for **DRAW TEXT**.

**LIST TEXT** - List the current text format in the console window.

**DRAW LABEL** - Create a text line with an arrow pointer.

**ARROWHEAD** - Choose between filled, closed and open.

**LENGTH** - Of arrowhead in current units.

**TEXT** - As for **DRAW TEXT**.

**DRAW LABEL [TEXT] ""[Basin] [ARROW-**

**HEAD] [OPEN] [LENGTH] 0.1 [ACTION] on**

**IMPORTANT!** The first 's' is where the point of the arrow will appear.



A drawing loaded from DWG file by BRUNNEN...

...and a drawing of the head part. You could do this with BROWZEDRAW



## PLOT COMMANDS

These commands are used to create output from SCAD. They are all accessed from the **PLOT** menu:

**PLOT EPSON** - Print the current drawing to an Epson compatible printer

**DENSITY** - Low for 9-pin printers (default), high for 24-pin.

**SCALE** - Size of output in relation to sheet size (1 is full size)

**ROTATE** - Turn the print through 90 degrees

**IMPORTANT** - You must specify a scale if the sheet size is larger than the paper in your printer

**PLOT HP** - Produce a screen grab of the current screen

**TO** - Specify the filename

**PLOT PREFERENCES** - Prints a screen dump to any printer selected in preferences.

**SOURCE** - select between screen for complete dump or drawing for just the picture

---

## GLOSSARY

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**ANGLE** - Location in degrees from the positive X axis (from 0° to 360° positive)

**AUTOCAD** - A very expensive PC CAD system generally considered the industry standard.

**AXIS** - Imaginary line, usually horizontal or vertical, from which drawing co-ordinates are calculated

**BACK SPACE** - The key on the keyboard used to erase the last character

**CAD** - Computer Aided Design.

**CAM** - Computer Aided Manufacture. Well beyond CAD's capabilities, this is the use of computer programmes to direct one or more manufacturing processes

**CLOSED** - A series of lines which form a loop.

**CONSOLE** - The window at the bottom of CAD's screen, used to enter commands at the keyboard. Also shows commands entered with the mouse.

**CO-ORDINATES** - Distance from the X and Y axis to the current point

**CPOINT** - Construction point. The small red crosses which appear when drawing an entity

**CURRENT UNITS** - Measuring system used i.e. millimetres, inches, mils etc

**DIMENSION** - CAD a method of drawing dimensions on the sheet.

**DWG** - The AutoCAD file format, the industry standard for CAD

**ELLIPSE** - An oval shape like a squashed circle

**ENTITY** - Anything which appears on the drawing e.g. lines, circles symbols text etc

**EQUIDISTANT** - The same distance apart.

**EXPLODE** - Reduces a complex entity or symbol made of many parts into its components e.g. The tag symbol would become an L3 parts instead of a single entity

**FILLET** - Make a square corner rounded

**GRID** - Equally spaced dots which are used to accurately place entities

**HPGL** - Hewlett Packard Graphics Language, the industry standard way of outputting drawings to a plotter

**IF** - The AutoCAD standard graphics file format

**JUSTIFY** - Aligns text to the left, right or centre of a point.

**LABEL** - A written label with an arrow pointing to an entity

**MIRROR** - Produces a mirror image of the selected entities

**PARALLEL** - Lines which are equidistant along their entire length the equals sign '=' is a good example of this. One line can be longer than the other as in the two vertical lines in 'W' which are parallel

**PERPENDICULAR** - At right-angles to an entity. The short-stroke of 'T' is perpendicular to the crossbar at the top.

**PLAT** - Output the drawing to a printer or plotter

**PLOTTER** - A large device which uses pens to create drawings. XCAD can tell you how to move its pens using the HPGL protocol.

**POLYGON** - A closed shape which is filled in black.

**REDRAW** - Redraws and redisplay all entities shown on the screen.

**ROTATE** - Spin an object about a specified point.

**SHEET** - The 'paper' on which you draw. XCAD can simulate a sheet of almost any size.

**SPLINE** - A smooth curve which passes through several specified points.

**STRING** - A series of lines which XCAD simulates to be a single entity.

**TANGENT** - A line which smoothly joins a curve. The two vertical lines on 'U' are tangent to its curve.

**TRIM** - Remove the end of a line connected to another point.

**UPDATE** - Replace an old symbol with a newer version.

**X AXIS** - An imaginary horizontal line running across the page from which co-ordinates are measured.

**Y AXIS** - An imaginary vertical line running up the page from which co-ordinates are measured.

**Zoom** - Increase or decrease the magnification used

---

## TRICKS AND TIPS

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Use the **SCALE ENTITY** (COPE) command to produce concentric circles and mirror effects.

There is a program on a Disk disk 373 called **PLT** which allows you to output drawings to any performance printer at its highest resolution, use it to improve your print-outs if you don't have a plotter. This disk can be obtained from most good PD libraries.

Try to learn the keyboard shortcuts for XCAD: it can save you hours of time.

Create symbols for frequently used objects, they will save you hours. Always experiment with unfamiliar commands before attempting to use them on your working diagrams. Save your work frequently: often XCAD can absorb as much of your attention that you create a finished drawing from the one you started.

Use circles as templates for creating curves with the **SPLINE** command. A good example of a nice shape is the toilet seat in the bathroom shown on page 66.

## WHERE TO NEXT?

Our coverdisk NCAD Designer will provide everything you need to get up and running in the exciting world of computer aided design. The program will also be valuable to those who wish to go further, and use it at a semi-professional level.

There are however several alternatives, both cheaper and more powerful which may also help you.

### 2D OR NOT 2D

Should you find NCAD Designer too difficult (even with this great guide book!) there are several very easy to use drawing programs that will let you create similar results (although with probably more effort). Drawing programs let you "draw" lines, squares and circles etc on screen so you can create similar illustrations to those in a CAD program. CAD packages do the same but work in exact dimensions, and have many additional tools for manipulating the components of the illustration (for lines and circles etc) and drawing them in ways that traditional architects and designers will find familiar. An example would be that in a drawing program you'd draw a diagonal line and move the start and end points to achieve a desired angle; in a CAD package however you'd draw a line and then type in the desired angle as degrees.

Among drawing programs are aimed at Amiga users who wish to obtain pictures - whereas CAD programs on the Amiga are for CAD users who happen to use an Amiga. The result is that drawing programs tend to make better use of the Amiga's intuitive and easy-to-use user interface, and are generally easier to understand and use than CAD programs.

The first of these is the public domain package *Sketchpad*. Being public domain (it shouldn't cost you more than £3) it's very cheap but it doesn't have anywhere near the power or flexibility of NCAD, however it will allow you to create simple illustrations.

Next up are the big commercial drawing programs. This includes programs like *ProDraw* from GoldDisk and *Art Expression* from SoftLogic. Both of these are very powerful and sophisticated - and also have a great many ancillary features (automatic picture tracing, Pattern colours etc) and will let you create pictures that simply wouldn't be possible with NCAD.

Silly brother of these programs are currently available in the shops - although if you hunt around you may find the odd copy in an advertisement or on smaller dealers shelves.



## UP, UP AND AWAY

If you've used XCAD and decided that it's perfect, but you could use a few more features you could do a lot worse than upgrade to XCAD 2000. This is the big brother of our cover disk version, and provides the ability to create drawings in three dimensions, allowing you to add depth to your plans.

XCAD 2000 can be ordered directly from Digital Multimedia (tel. 081 893 4000) and if you've got our XCAD cover disk you'll be eligible for a special discount. The great advantage of this program is that it works in exactly the same way as XCAD Designer so everything you've already learnt won't be wasted!

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